

REMARKS

Reconsideration and allowance in view of the foregoing amendment and the following remarks are respectfully requested.

Claims 14-25 are pending in the application. Claims 14, 19 and 21 are amended.

Claims 22, 23, 24 and 25 are newly added.

Entry of the Amendment is proper under 37 C.F.R. §1.116 as the amendments: (a) place the application in condition for allowance for the reasons discussed herein; (b) do not present any new issues that would require further consideration and/or search as the amendments merely amplify issues discussed throughout the prosecution; and (c) place the application in better form for appeal, should an appeal be necessary. The amendments are necessary and were not earlier presented as they are in response to a new ground of rejection entered in the Final Rejection. Entry of the Amendment is thus respectfully requested.

Claims 14, 15, 16, 19 and 21 were rejected under 35 U.S. C. §103(a) over Nemoto et al. (U.S. Patent 6,025,213) in view of Tsutsui (U.S. Patent 5,798,536). Applicant respectfully submits that the amendments to claims 14, 19 and 21 obviate the rejection.

With respect to claims 14 and 19, Applicant notes that each of these independent claims recites “the light-emitting element or device including a substrate and a positive electrode that covers substantially an entire surface of a light-emitting layer of the light-emitting element or device, and the positive electrode reflecting light emitted from the light-emitting layer toward the light-emitting layer, such that the light passes through the substrate and the transparent base.” By contrast, Nemoto et al. disclose a semiconductor light-emitting device package wherein “a laser diode LD formed of a horizontal resonator formed on one surface of a semiconductor substrate 35 (reference numeral 36 generally represents an active layer), a reflection surface 38 with an inclination of 45° is opposed to one resonator end face

37A of resonator end faces 37A, 37B and light emitted from the resonator end face 37A is reflected on the reflection surface 38 and emitted in the vertical direction.” (See Col. 4, Lines 60-67.) The semiconductor light-emitting device package of Nemoto et al. further comprises a transparent package window portion which is “transparent to a wavelength of light emitted from the laser diode LD.” (See Col. 5, Lines 7-8.) In other words, Nemoto et al. disclose a semiconductor light-emitting package wherein the light is extracted from the laser diode by means of a 45° reflection surface and passes through the transparent package window. (See for instance Figs. 5B, 6, 7B.) However, Nemoto et al. do not disclose or suggest a semiconductor light-emitting device package wherein the light is emitted from the light-emitting layer, reflected by the positive electrode and passes through the substrate and the transparent base.

In addition, Applicant respectfully submits that Tsutsui fails to overcome the deficiencies of Nemoto et al. discussed above, *i.e.* Tsutsui does not disclose or suggest a semiconductor light-emitting device package wherein the light is reflected by the positive electrode and passes through the substrate and the transparent base. To the contrary, Applicant respectfully submits that Tsutsui teaches away from the semiconductor light-emitting apparatus disclosed in this invention for the following reason. Tsutsui points out on Col. 2, lines 5-11 that “in the conventional structures, there involved are further disadvantages. That is, semiconductor device of Fig. 7(b) radiates light from the light-emitting region of the semiconductor layer through the sapphire substrate in the backside of the chip.” Tsutsui further adds that “in this structure, no efficient reflection is available for the light emitted toward the chip substrate back to the front of the device.” In other words, Tsutsui clearly suggests that it is undesirable that the light pass through the substrate. Therefore, Applicant respectfully submits that Tsutsui does not provide a motivation or

suggestion to create a structure wherein the light emitted from the laser diode passes through the substrate. Accordingly, reconsideration and withdrawal of the rejection of claims 14 and 19 under 35 U.S.C. §103(a) over Nemoto et al. in view of Tsutsui are respectfully requested.

With respect to claim 21, Applicant notes that this independent claim recites “a positive electrode and a negative electrode formed on a surface of said light emitting layer on which the sapphire substrate is not formed” and “said positive electrode and said negative electrode are supplied with electricity through a wire.” By contrast, Nemoto et al. disclose a light-emitting device wherein the substrate and an electrode are formed on a surface of the light-emitting layer. (See for instance Fig. 13F) In addition, Nemoto et al. do not disclose a light-emitting device wherein the positive and the negative electrode are supplied with electricity through a wire. Rather, the electrodes are “bonded to and fixed to the interconnection pattern...of the transparent substrate...by flip-chip bonding.” (See Col. 10, line 60-62)

Furthermore, Applicant respectfully submits that Tsutsui fails to overcome some deficiencies of Nemoto et al. discussed above. Indeed, Tsutsui does not disclose or suggest a light-emitting device wherein a positive electrode and a negative electrode are formed on a surface of said light-emitting layer on which the sapphire substrate is not formed. Rather, Tsutsui discloses a light-emitting device wherein the substrate and the electrodes are formed on a surface of the light-emitting layer. (See Figs. 1-5)

In conclusion, Applicant respectfully submits that neither Nemoto et al. alone or in combination, nor Tsutsui teaches the invention of claim 19. Accordingly, reconsideration and withdrawal of the rejection of claim 21 under 35 U.S.C. §103(a) over Nemoto et al. in view of Tsutsui are respectfully requested.

Claims 15 and 16 depend from claim 14 and are patentable for at least the same reasons given above related to claim 14. Accordingly, Applicant respectfully requests that the rejection of claims 15 and 16 under 35 U.S.C. §103(a) over Nemoto et al. in view of Tsutsui be withdrawn.

Claims 17 and 18 were rejected under 35 U.S. C. §103(a) over Nemoto et al. (U.S. Patent 6,025,213) in view of Tsutsui (U.S. Patent 5,798,536) and further in view of Shimizu (J.P. 408007614). Applicant respectfully submits that the amendment to claim 14 obviates the rejection.

Claims 17 and 18, which depend from claim 14, recite additional features of the invention and are allowable for the same reasons discussed above with respect to claim 14 and for the additional features recited therein. In addition, it is respectfully submitted that Shimizu fails to correct the deficiencies of Nemoto et al. and Tsutsui with respect to claim 14 and even assuming it would have been obvious to combine Nemoto et al., Tsutsui and Shimizu, such a combination would not have resulted in the invention of claims 17 and 18.

Accordingly, reconsideration and withdrawal of the rejection of claims 17 and 18 under 35 U.S.C. §103(a) over Nemoto et al. in view of Tsutsui and further in view of Shimizu are respectfully requested.

Claim 20 was rejected under 35 U.S. C. §103(a) over Nemoto et al. (U.S. Patent 6,025,213) in view of Tsutsui (U.S. Patent 5,798,536) and further in view of Vriens (U.S. Patent 5,813,753). Applicant respectfully submits that the amendment to claim 19 obviates the rejection.

Claim 20, which depends from claim 19, recites additional features of the invention and is allowable for the same reasons discussed above with respect to claim 19 and for the additional features recited therein. In addition, it is respectfully submitted that Vriens fails to

correct the deficiencies of Nemoto et al. and Tsutsui with respect to claim 19 and even assuming it would have been obvious to combine Nemoto, Tsutsui and Vriens, such a combination would not have resulted in the invention of claim 20.

Accordingly, reconsideration and withdrawal of the rejection of claim 20 under 35 U.S.C. §103(a) over Nemoto in view of Tsutsui and further in view of Vriens are respectfully requested.

Claims 22, 23, 24 and 25 are newly added. Applicant respectfully submits that these claims are supported by the specification. Claims 22, 23 and 24 find a basis, for example, in table 1 on page 17. Claim 25 finds a basis, for example, in lines 23-25, on page 18. Also, Applicant submits that claims 22, 23, 24 and 25 depend respectively from claims 14, 19, 21 and 21. Accordingly, Applicant respectfully submits that these claims are in condition for allowance.

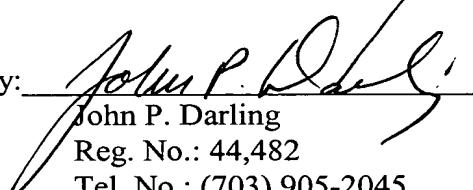
Attached hereto is a marked-up version of the changes made to claims 14, 19 and 21 by the current amendment. The attached Appendix is captioned "Version with markings to show changes made."

Applicant has addressed all of the Examiner's rejections and respectfully submits that the application is in condition for allowance. A notice to that effect is earnestly solicited.

Respectfully submitted,

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Attachment: Appendix (pp. 10-11)

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APPENDIX

VERSION WITH MARKINGS TO SHOW CHANGES MADE

IN THE CLAIMS

Claims 14, 19 and 21 are amended as follows:

14. (Twice amended) A semiconductor light-emitting apparatus of flip chip bonding type, comprising:

a transparent base made of an inorganic material, which has on one side thereof a first bonding pad and a second bonding pad to be connected to a pair of lead frames with a space between the first and the second bonding pads where a semiconductor light-emitting element is fixed, the light-emitting element including a substrate and a positive electrode that covers substantially an entire surface of a light-emitting layer of the light-emitting element, and the positive electrode reflecting light emitted from the light-emitting layer toward the light-emitting layer, such that the light passes through the substrate and the transparent base.

19. (Twice amended) A pair of lead frames for use in a light-emitting apparatus of flip chip bonding type comprising:

a transparent base having on a first surface thereof a first and a second bonding pad and

a GaN semiconductor light-emitting device fixed on the first surface thereof, wherein a first lead frame has a first mount which faces the dominant light emitting direction of the light-emitting apparatus and on which the first bonding pad is to be fixed, and a second lead frame has a second mount which faces the dominant light emitting

direction and on which the second bonding pad is to be fixed, the light-emitting device including a substrate and a positive electrode that covers substantially an entire surface of a light-emitting layer of the light-emitting device, and the positive electrode reflecting light emitted from the light-emitting layer toward the light-emitting layer, such that the light passes through the substrate and the transparent base.

21. (Twice amended) A light-emitting diode comprising:

a sapphire substrate;

a light emitting layer made of GaN semiconductor and formed on said sapphire substrate; and

a positive electrode and a negative electrode formed on a surface of said light emitting layer on which the sapphire substrate is not formed;

wherein:

said positive electrode and said negative electrode [is] are supplied with electricity through a wire, and

said positive electrode reflects light from said light emitting layer toward said sapphire substrate and covers substantially an entire surface of the light-emitting layer.

Claims 22, 23, 24 and 25 are new.

End of Appendix.